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Redescription of the male of *Pterotricha strandi* (Aranei: Gnaphosidae) with special emphasis on the structure of the palp

Переописание самца *Pterotricha strandi* (Aranei: Gnaphosidae) и строение его пальпы

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KEY WORDS: Araneae, ground spider, Gnaphosinae, Turkmenistan, Central Asia, embolus, stylus.
КЛЮЧЕВЫЕ СЛОВА: Araneae, гнафозиды, Gnaphosinae, Туркмения, Средняя Азия, эмболюс, стилюс.

ABSTRACT. The male palp of the poorly known, ground spider, *Pterotricha strandi* Spassky, 1936 is described in detail. Several features of the palp have not been documented before in the Gnaphosidae, nor the entire Dionycha: 1) presence on stylus on the embolus, 2) embolus composed of embolus proper and “paraembolus”, and 3) presence of an opening inside tibial apophysis.

РЕЗЮМЕ. Описана в деталях пальпа самца *Pterotricha strandi* Spassky, 1936. В структуре пальпы обнаружены признаки, ранее не отмеченные в пальпе Gnaphosidae и вообще среди Dionycha, а именно: 1) наличие стилюса эмболюса, 2) основная часть эмболюса состоит и собственно эмболюса и «параэмболюса» и 3) наличие полости в отростке голени.

Introduction

Pterotricha strandi Spassky, 1936 was described based on both sexes collected at Akhal-Teke, Turkmenistan [Spassky, 1936]. Since then it has not been treated in taxonomic publications except by Marusik et al. [2013], who reproduced figures made by Spassky to to differentiate it from *P. loeffleri* (Roewer, 1955) from adjacent Iran. During study of material from Central Asia, one sample from Kara-Kala (=Garrygala, currently Makhtumkuli) was found that contained over a dozen males of *P. strandi*. Although the material is poorly preserved (bad alcohol concentration) and disarticulated, some almost complete terminal parts of the palp, and palpal tibia were recovered. These structures were studied with a scanning electron microscope and several features not documented before were found. The goal of this paper is to provide illustrations of the male palp and to record interesting characters previously unknown in the Gnaphosidae.

Material and methods

Specimens were photographed using a JEOL JSM-5200 Scanning Electron Microscope at the Zoological Museum, University of Turku. Specimens studied belong to Zoological Museum of the Moscow State University (ZMMU). All measurements are given in millimeters.

Pterotricha strandi Spassky, 1936
Figs 1–14.

Pterotricha strandi Spassky, 1936: 37, f. 1–3 (♂♀); Marusik et al., 2013: 350, f. 17 (♂♀, figures reproduced from Spassky [1936]).

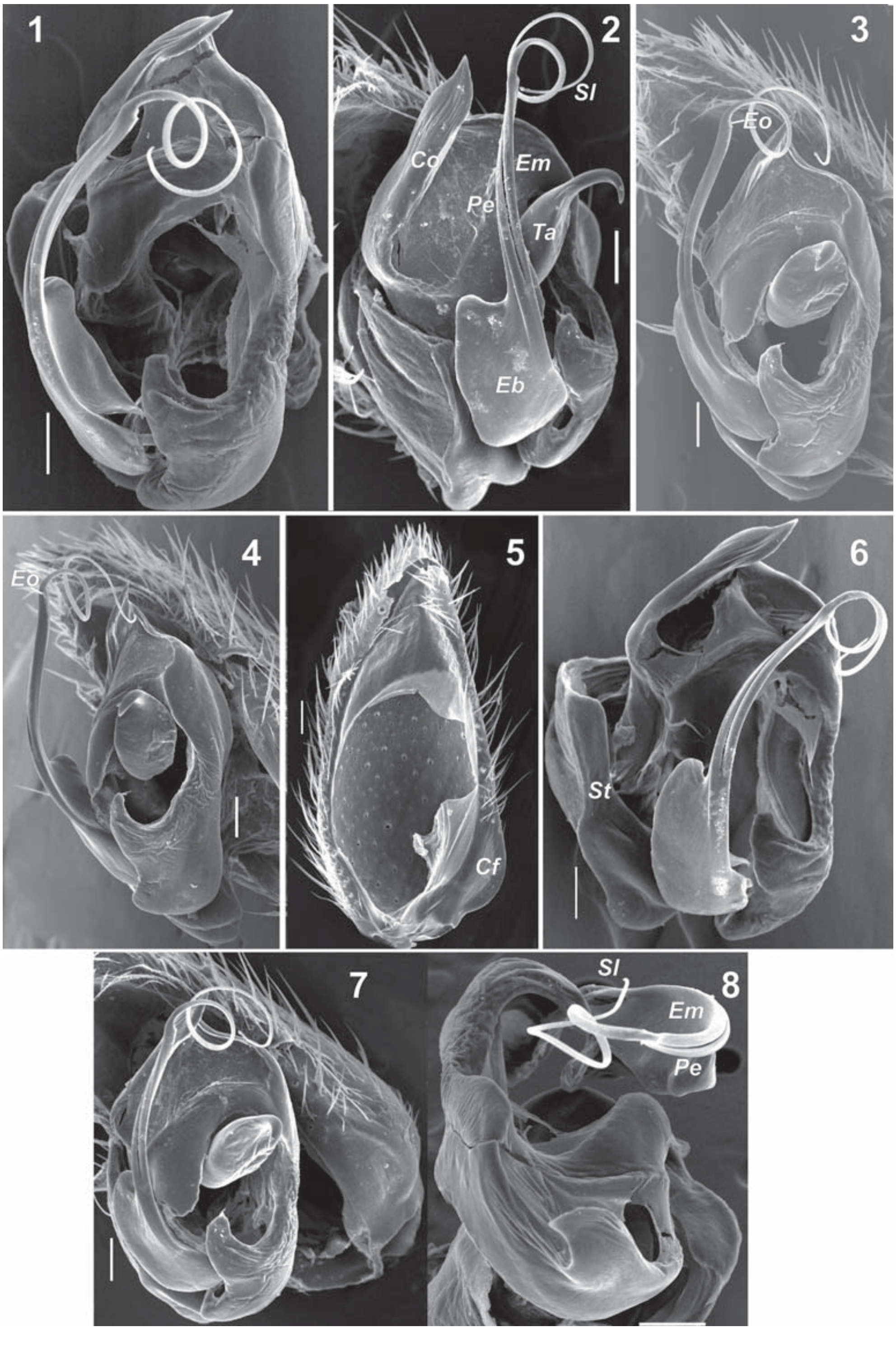
MATERIAL EXAMINED. 14 ♂♂ in poor condition (ZMMU), TURKMENISTAN, SW Kopetdagh Mts, 12 km W of Kara-Kala, valley of Su River, 38°24′N, 56°07′E, mountain slope, 24.04.1991 (V.V. Dubatolov).

DIAGNOSIS. *Pterotricha strandi* is most similar to *P. loeffleri*, a species known from northern Iran. Males of these species differ by the proportions of the cymbium, twice longer than wide in *P. strandi* and 1.7 longer than wide in *P. loeffleri* (cf. Fig. 5 and fig. 11 in Marusik et al. [2013]). Palpal tibia in Iranian species is more bent in ventral view and ventral lobe of tibial apophysis is larger (more extended ventrally) in *P. loeffleri*.

NOTE. Because all specimens are in poor condition, all parts disassembled, description of size, colour and pattern is impossible.

DESCRIPTION. Described in detail (including leg length, spination and pattern) by Spassky [1936]. Male carapace 2.6 long, 2.2 wide. Female 2.5 long,1.9 wide.

Male palp as in Figs 1–13: tibia more than 2 times longer than wide (without RTA), slightly bent; retrolateral apophysis large, width of terminal part of tibia almost equal tibial length (Fig. 9); tibial apophysis complex with 3 distinct parts, ventral lobe (*Vl*), and two arms anterior (*Aa*) and dorsal (*Da*); arms with

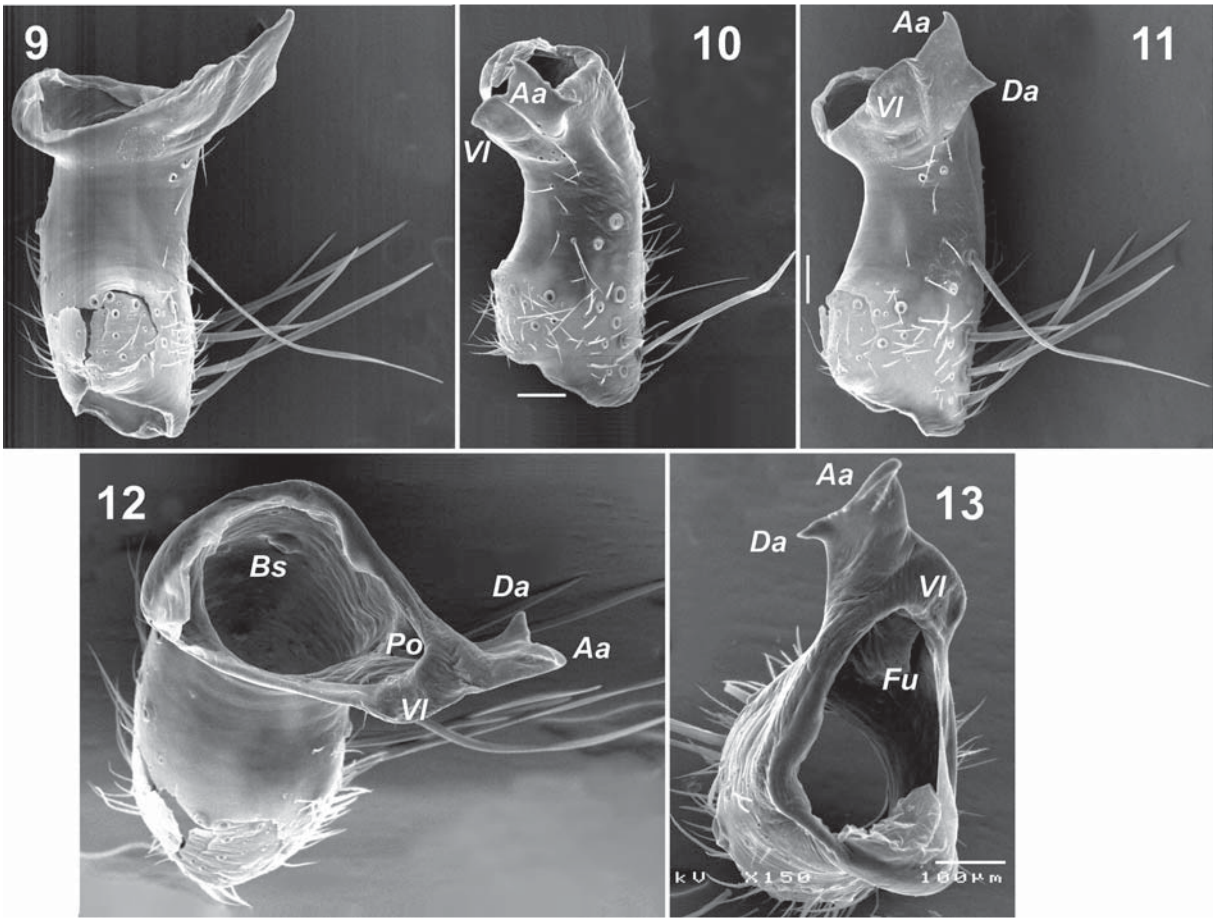


Figs 1–8. Macerated bulb and cymbium of *Pterotricha strandi*: 1 — bulb, ventral, tegular apophysis lose; 2 — bulbus, prolateral; 3–4 — cymbium and bulb, ventral and retrolateral; 5 — cymbium with removed bulb and haematodocha; 6 — partly expanded bulb, prolateral; 7 — cymbium and partly expanded bulb, ventral; 8 — bulb, anterior. Scale 0.1 mm.

Abbreviations: *Cf* — cymbial furrow; *Co* — "conductor"; *Eb* — embolic base; *Em* — embolus proper; *Eo* — embolic opening; *Pe* — paraembolus; *Sl* — stylus; *St* — subtegulum; *Ta* — tegular apophysis.

Рис. 1–8. Мацерированный бульбус и цимбиум *Pterotricha strandi*: 1 — бульбус, снизу, без тегулярного отростка; 2 — бульбус и цимбиум, пролатерально; 3–4 — цимбиум и бульбус, снизу и ретролатерально; 5 — цимбиум без бульбуса и гематодохи; 6 — бульбус, пролатерально; 7 — цимбиум и частично вздутый бульбус, снизу; 8 — бульбус, спереди. Масштаб 0,1 мм.

Сокращения: *Cf* — складка цимбиума; *Co* — "кондуктор"; *Eb* — основание эмболюса; *Em* — собственно эмболюс; *Eo* — отверстие эмболюса; *Pe* — параэмболюс; *Sl* — стилет; *St* — субтегулюм; *Ta* — тегулярный отросток.



Figs 9–13. Macerated tibia of *Pterotricha strandi*: 9 — ventral; 10 — anterior-retrolateral; 11 — retrolateral; 12 — anterior-ventral; 13 — anterior. Scale 0.1 mm.

Abbreviations: *Aa* — anterior arm; *Bs* — base of seta ? (or trichobothria); *Da* — dorsal arm; *Fu* — furrow of the *Po*; *Po* — pocket (hollow); *Vl* — ventral lobe.

Рис. 9–13. Мацерированная голень пальпы Pterotricha strandi: 9 — снизу; 10 — спереди-ретролатерально; 11 — ретролатерально; 12 — спереди-снизу; 13 — спереди. Масштаб 0,1 мм.

Сокращения: *Aa* — передний вырост; *Bs* — основание щетинки ? (или трихоботрии); *Da* — дорзальный вырост; *Fu* — щель кармана; *Po* — карман (полость); *Vl* — нижняя лопасть.

triangle tips; internal part of apophysis with large pocket (*Po*), ventral side of pocket with furrow (*Fu*); baso-retrolateral and dorsal parts of tibia with strong setae, bases of these setae (*Bs*) are visible on internal side of tibia. Cymbium (Figs 5, 7) elongate, 2 times longer than wide, with distinct furrow (*Cf*) about 1/4 of cymbial length. Subtegulum (*St*) large, envelops base of tegulum. Tegulum of complex shape, membranous parts in specimens studied rotted out; terminal part with triangular well sclerotized extension, likely serving as a conductor (*Co*); tegular (=median) apophysis (*Ta*) simple, droplet shaped, with claw-like tip directed ventrally. Embolus complex, with large and flat base (*Eb*), free part of embolus composed of 2 filamentous parts, embolus proper (Em) and "paraembolus" (Pe); embolus proper with fine ridges (visible on Figs 4, 6) composed by fine spines, "paraembolus" lacks microsculpturing; embolic opening (*Eo*) located near tip of conductor at fused junction of embolus proper and paraembolus; tip of embolus with filamentous coiled stylus (*Sl*).

COMMENT. Based on the illustrations of *P. loeffleri* in Marusik et al. [2013] and SEM images (herein) of *P. strandi*, it is possible that the two names can be synomyms.

DISTRIBUTION. So far, the species is known from four localities in Southern Turkmenistan [Mikhailov, Fet, 1994] (Fig 14).

Discussion

While studying the palp of this species, several features were recognized that have not been previously documented in the Gnaphosidae or Dionycha [cf. Ramirez, 2014]. First, there is the presence of a stylus of the embolus (extension of embolus over opening). Such a structure is well known in some other families, such as the Scytodidae [e.g. *Scytodes thoracica* (La-



Fig. 14. Collecting localities of *Pterotricha strandi*.
Рис. 14. Места сборов *Pterotricha strandi*.

treille, 1802)], Oonopidae [e.g. *Oonops pulche*r Templeton, 1835; *Spinestis nikita* Saaristo et Marusik, 2009, *Oonopinus angustatus* (Simon, 1882), see Saaristo et Marusik, 2009: f. 1–3, 28], or less well known and much shorter in the Linyphiidae (e.g *Kikimora palustris* Eskov, 1988, see Koponen et al., 2002: f. 3G). The stylus was known in *Pterotricha*, but it was considered as the tip of embolus and called "filament" [Levy, 1995]. Only some *Pterotricha* have a stylus: *P. lesserti* Dalmas, 1921, *P. chazaliae* (Simon, 1895), *P. schaefferi* (Audouin, 1826), *P. parasyriaca* Levy, 1995, *P. kochi* (O. Pickard-Cambridge, 1872) and *P. loeffleri* [cf. Levy, 1995; Marusik et al., 2013]. Other species has normal (gradually tapering) embolus or embolus with widened tip, like in *P. cambridgei* (L. Koch, 1872).

The second feature not documented before in the Gnaphosidae is a complex embolus composed of two filamentous parts, the embolus proper, and "paraembolus". Thirdly, the structure documented here as the "conductor" is unknown in other Gnaphosinae and seems not to be homologous to that known in the Drassodinae (*Drassodes* Westring, 1851 and *Haplodrassus* Chamberlin, 1922) which is a weakly sclerotized or membranous sclerite. In other Pterotchicha species it is a wide, flat, well sclerotized, anterior extension of the tegulum.

Fourthly, the feature not documented in Gnaphosidae is internal structure of the tibial apophysis. It was found to be not a solid sclerite but hollow sclerite with complex cavity.

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